Q172 Quantizer Aid

Sep 2014

The Q172 Quantizer Aid operates in conjunction with the Q171 Quantizer Bank providing a fourth quantizer channel along with many unique features. The Q172 can not operate without the Q171.

Features include rotary switch selection of the note group and the addition of new groups including quarter-tone, and 3 user-programmable groups.

A MIDI output jack produces digital notes matching the quantized output. This effectively turns our analog sequencers (Q119 and Q960) into MIDI sequencers and offers many interesting connectivity possibilities with digital equipment.

A Bypass switch provides real-time selection of a quantized or un-quantized output.

A 3-position Transpose switch lets the operator add or subtract an octave to the quantized output in real-time. The transpose input jack provides voltage controlled transposition to the Pitch voltage output.

The MIDI input jack provides a simple method of programming the 3 user-programmable note groups. Simply plug in a keyboard controller and press the keys you'd like in your custom group. Groups are saved through power cycles.

The Gate input can be used to control the timing of quantization and allows operation as a digital Sample and Hold. The Gate output provides a pulse at each quantization output change to trigger external events such as envelope generators and sequencers.

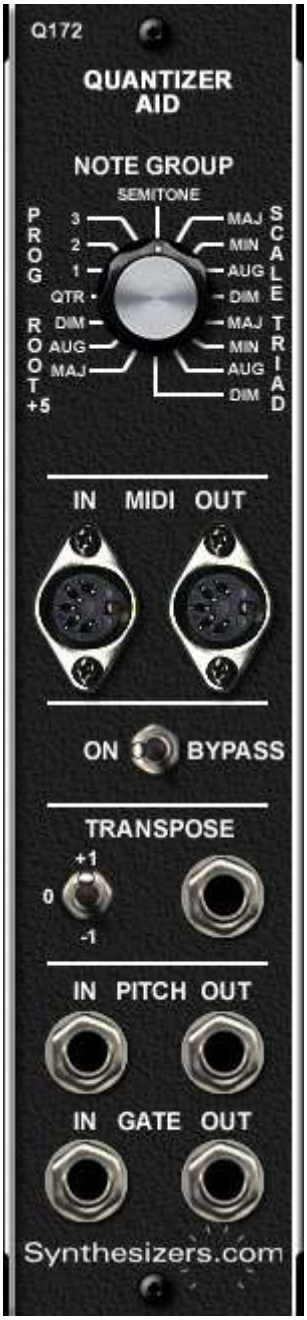
Specifications

Panel Size: Single width 2.125"w x 8.75"h.
Quantization Method: Processor controlled using ADC/DAC.
ADC Inputs: 10-bit with precision buffer/scaler.
DAC outputs: 12-bit with precision buffer/scaler.
Power: none in addition to the Q171
Mounting: Must be placed to the immediate right or left of the Q171

Note:
For details about quantizing with the Q171/Q172 module pair, see the data sheet for the Q171.

Q172 Quantizer Aid

Sep 2014



Selects which note intervals are produced at the Pitch and MIDI outputs.

MIDI input used for programming the 3 programmable note groups

Bypasses the quantizer and connects the pitch input directly to the pitch output.

Real time transposition of the MIDI and pitch outputs.

The voltage to be quantized.

This gate forces a new quantized output. Without it, quantization happens automatically.

A MIDI version of each note produced by the quantizer. This effectively creates voltage to MIDI conversion.

Voltage inserted here is added to the pitch output below. Great for arpeggiations.

This is the quantized pitch voltage output.

A short gate pulse occurs here whenever a new pitch output is produced.

Q172 Quantizer Aid

Sep 2014

Controls and Connectors

Note Group Selection Switch
Determines the group of notes produced at the quantized output. Three of the groups are user-programmable.

MIDI Input
This jack allows programming of the 3 user-programmable note groups. Simply connect a keyboard controller set to MIDI Channel 1, select the note group (Prog 1, Prog 2, Prog 3), then press keys (within a single octave C-B) to add notes to the group. Pressing a key multiple times toggles the note on/off. Programmed keys are quantized for all octaves. Quantization is performed in real-time as the notes are added or removed from to the group. The group is cleared when a note outside the octave is received.

MIDI Output
This jack provides a source of MIDI notes that follow the quantized output. This allows any analog voltage source such as sequencers and oscillators to produce MIDI notes in real-time. All notes are sent on MIDI channel 1, with a velocity of 60, and preceded by a pitch-bend message. When a new note is sent, the old note is turned Off (velocity=0), and an All-Notes-Off command is sent to prevent hung notes.

Bypass Switch
Real-time switching of the pitch output between the original input signal and the quantized version.

Transpose Switch
Provides real-time transposition of the quantized voltage output and the MIDI output - plus 1 octave and minus 1 octave.

Transpose Input
This input voltage is summed with the Pitch Out voltage for voltage-controlled transposing. MIDI output data is unaffected.

Pitch Input
Voltage to be quantized. This does not have to be a pitch voltage, it can be any signal within the valid range. Voltage range is 0-10 volts (10 octaves). Voltages below 0 will be quantized as 0 and voltages above 10 will be quantized as 10. To quantize bipolar signals such as -5v/+5v waveforms from an oscillator, use a Q125 Signal Processor to shift (add +5v offset) the signal to produce 0-10v.

Pitch Output
Quantized voltage output. The output voltage produced will be the closest match to a note within the selected note group. The output is low impedance capable of driving 6+ oscillators with minimal droop.

Gate Input
Allows control of quantizing timing. When no plug is inserted, quantizing occurs continually with timing determined by the internal processor. When a plug is inserted, quantizing occurs on the rising edge of the signal (typically 0 - 5 volts). This allows the quantizer to operate as a Sample & Hold, and to provide control over quantizing timing.

Gate Output
Short 5ms pulse (0 - 5 volts) is produced when the quantized pitch output changes. A 2ms off-time is guaranteed.

Q172 Quantizer Aid

Sep 2014

Usage and Patch Tips

Note:
For details about quantizing with the Q171/Q172 module pair, see the data sheet for the Q171.

Basics

The Q172 module essentially adds an additional quantizer channel to the Q171, but with several additional features. The feature switches on the Q172 module apply only to the 4th channel of the Q172 and do not affect the first three channels found on the Q171 module.

Programmable Groups

Three programmable groups are available to store custom note groups. These three groups are programmed using the MIDI input jack. Each programmable group can store up to 24 notes along with pitch-bend data. All programmable groups are set at the factory to semitones (12 notes per octave).

To program a custom group, set the Note Group selection switch to the desired programmable group - 1, 2 or 3. Then patch the MIDI output of a MIDI controller (typically a keyboard) to the MIDI input on the Q172 panel. The MIDI controller must be set to MIDI channel 1.

Choose an octave (C thru B) on the MIDI controller to be used for programming. Begin pressing the desired notes. Pressing a note repeatedly will toggle the note On/Off - ie: add/remove it from the group. Pressing a key outside of the octave will cause all notes in the group to be cleared.

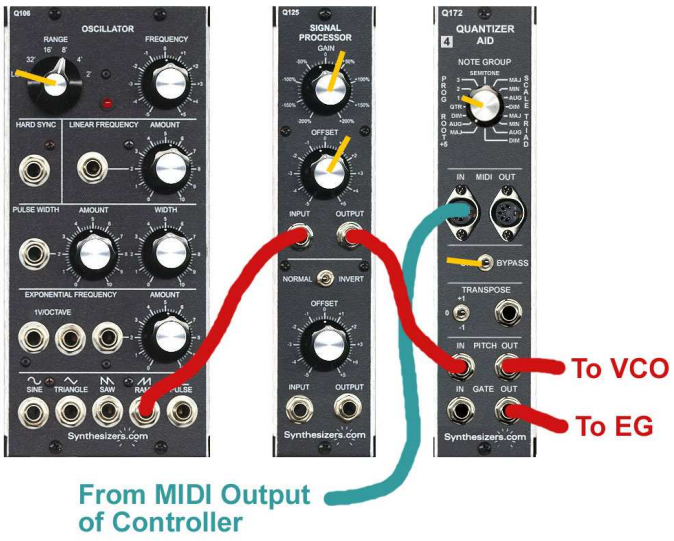
Each programmed key also includes pitch-bend data. Use the pitch-bend wheel on a controller then press a key to program the note. When a note is added to a group with pitch-bend, it must also have the exact same pitch-bend to removing it. This can be made easier by programming the Q172 using MIDI software running on a personal computer.

Programmable note groups are saved automatically to internal non-volatile memory if the quantizer does not receive a new MIDI note for 10 seconds.

It's easier to program a group when you can hear what is happening. Patch the Pitch Out and Gate Out of the quantizer to a normal synthesizer patch (VCO,EG,VCA) so you can hear the output. Patch a Ramp waveform from a Q106 Oscillator through a Q125 Signal Processor, then to the Pitch In of the Quantizer.

Adjust the speed of the oscillator to about 5hz so you can hear the notes. Adjust the Offset and Gain of the Q125 to get a range of voltages that lets you hear all the notes in one or more octaves. Now you can hear the notes as you add and remove them from the programmable group.

Q172 Programmable Note Groups



Calibration

See the Q171 Datasheet for calibration information.

Circuit Board Connector Layout

The following drawing shows how cables from the Q172 Aid module connect to the Q171 circuit board.